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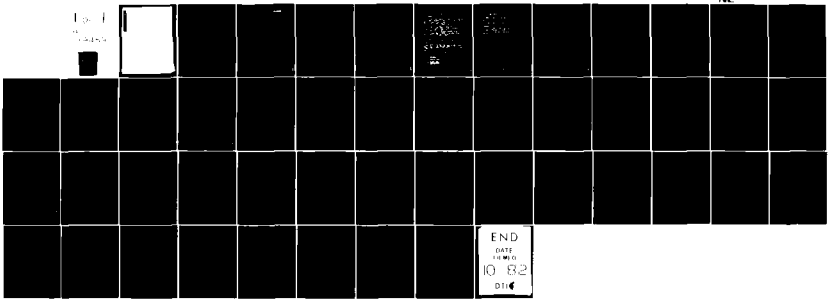

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TAILORING SHIPBOARD TRAINING TO FLEET PERFORMANCE NEEDS: IV: TRAINING MODULES AND ADMINISTRATIVE AIDS FOR THE SHIPBOARD PROPULSION PLANT OPERATOR TRAINING (SPPOT) PROGRAM

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Prototypes of performance-oriented instructional modules and administrative aids were developed for use in training main propulsion watchstanders in shipboard environments. These materials, along with previously developed procedural trainings aids, constitute the Shipboard Propulsion Plant Operator Training (SPPOT) program. The modules provide relevant background on propulsion fundamentals and the functional characteristics of propulsion systems. Materials are ship-specific and designed for use in

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work environments. The administrative aids related SPPOT materials to the Navy's Personnel Qualification Standards (PQS) system.

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FOREWORD

This research and development was conducted within advanced development subproject Z1180-PN.01 (Enhancing Fleet Training Readiness Through Improved Shipboard Training) under the sponsorship of the Chief of Naval Operations (OP-01). The objectives of the subproject are to design, develop, and evaluate an approach for identifying critical fleet personnel readiness deficiencies and to develop shipboard training programs that are compatible with fleet priorities and the constraints of an operational environment.

This report is the fourth in a series being issued under this subproject. The first, NPRDC TR 78-30, described the general approach, which was designed for tailoring training systems to the requirements of shipboard environments, and a survey of shipboard performance problems conducted aboard three aircraft carriers. Survey results led to the selection of 1200 psi main propulsion systems as the target problem area for this project. The second, NPRDC TR 81-23, described an analysis conducted to clarify the nature of the performance problems being experienced by main propulsion personnel. The third, NPRDC TR 82-6, described the design of the Shipboard Propulsion Plant Operator Training (SPPOT) program and the development and evaluation of procedural training aids included in that program. The current report describes the development of additional training and administrative materials. The training materials were developed under contract by Data Design Laboratories, Cucamonga, CA.

Appreciation is expressed for the high level of support and cooperation received from the Conventional Marine Propulsion Training Steering Committee; the staff of Commander Naval Air Force, U.S. Pacific Fleet and the Personnel Qualification Standards Group, San Diego; and the Commanding Officer and Engineering Department personnel of USS CONSTELLATION. Without their help, the design and the development of SPPOT would not have been possible.

JAMES F. KELLY, JR.
Commanding Officer

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Technical Director

SUMMARY

Problem and Background

The increasing complexity of shipboard performance requirements has strained the fleet's ability to maintain personnel readiness through on-ship instruction. The difficulties in providing shipboard training have been further increased by personnel turbulence and changes in operational requirements. To address this problem, the Navy Personnel Research and Development Center is conducting an effort to design, develop, and evaluate a new approach to shipboard training that is more responsive to fleet priorities and compatible with the constraints of a shipboard environment.

This effort began with an investigation of existing fleet performance problems that resulted in the selection of main propulsion as a performance area for this research. Based on an analysis of propulsion performance problems, it was determined that a comprehensive training program was required to provide the ship with the ability to qualify and maintain a three-section Condition III main propulsion watch. A number of strategies were developed for conducting propulsion watchstander training in shipboard environments, and a comprehensive training program, the Shipboard Propulsion Plant Operator Training (SPPOT) program, was designed. A set of procedural training aids were developed for use with the SPPOT program. Demonstrations of these aids resulted in highly positive evaluations from propulsion watchstanders.

Purpose

The purpose of the effort described herein was to develop the remainder of the training and administrative materials included in the SPPOT program.

Approach

SPPOT training and administrative materials were developed for use in USS CONSTELLATION (CV 64). The design of these materials was based on strategies for shipboard training of propulsion watchstanders identified previously in this project. Accuracy of content was maintained by direct validation against systems and equipment in CONSTELLATION.

Results

The following SPPOT materials were developed:

1. Instructional aids

   a. [illegible]
   b. [illegible]

2. [illegible]

   a. [illegible]
   b. [illegible]
   c. [illegible]

3. Administrative aids

   a. PQS/SPPOT Qualification Section 7 document
   b. PQS/SPPOT Manager's Guide

These materials were implemented on a trial basis in CONSTELLATION. Efforts to evaluate SPPOT and generalize it to other Navy platforms are in progress.

Conclusion

The design and content of the SPPOT training materials and administrative aids appear well suited for training propulsion plant personnel to become qualified watch-standers within the constraints of the shipboard environment.

Recommendations

1. If the SPPOT program has a significant impact on fleet operations, consideration should be given to applying similar problem analysis and training development techniques to other areas where similar problems are being experienced.

2. The underlying research premises and the training objectives and principles that shaped SPPOT should also guide follow-on production efforts to ensure the program's continued effectiveness.

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INTRODUCTION

Problem and Background

The increasing complexity of shipboard performance requirements has strained the fleet's ability to maintain personnel readiness through on-ship instruction. The difficulties of providing shipboard training have been further increased by personnel turbulence and changes in operational requirements. Attempts to develop more adequate shipboard training systems have not met fleet requirements. To address this problem, the Navy Personnel Reseach and Development Center is conducting an effort to design, develop, and evaluate a new approach to shipboard training that is more responsive to fleet priorities and compatible with the constraints of a shipboard environment.

This is the fourth report issued concerning this project. The first described the general approach taken in the effort and the results of a survey conducted on board three aircraft carriers to identify problem performance areas (Main, Abrams, Chiles, Flaningam, & Vorce, 1978). Based on the results of this survey, main propulsion was selected as the target problem area for the project.

The second report described a more detailed analysis of problems experienced with main propulsion systems, which led to a decision to focus attention on propulsion watchstander performance, with the goal of establishing a qualified, three-section steaming watch (Chiles, Abrams, Flaningam, & Vorce, 1981). Finally, the third report described an investigation of problems related to the training of propulsion watchstanders in shipboard environments (Main, Abrams, Chiles, Todd, & Cunanan). The following general training strategies were specified:

1. Formalize existing on-the-job training (OJT).

2. Design materials for use in the working environments.

3. Give training materials a performance orientation.

4. Focus on only those skills and knowledges needed by the watchstander for his immediate watch assignment.

Skills and knowledge required by propulsion watchstanders were categorized and an overall training program, the Shipboard Propulsion Plant Operator Training (SPPOT) program, was designed. A data base for operator performance requirements was constructed for USS CONSTELLATION (CV 64), the ship for which the pilot verison of the SPPOT program was to be developed. The data base consisted of complete procedural descriptions of all of the actions performed in operating 36 major systems that make up the propulsion plant. The data were presented in the form of algorithmic flow charts with branching paths for alternative procedures or remedial actions.

This data base was used in the development of SPPOT guides, the initial training product for the SPPOT program. These guides, which consisted of pocket-sized packs of laminated cards that organized and grouped procedural actions under functional headings, were designed as training aids for use in conducting OJT for propulsion trainees. By organizing watchstander actions within the context of operational functions, the SPPOT guides aided the trainee to understand the purpose for or reason behind his actions. Supplementary information, which alerted the trainee to possible consequences of inappropriate actions, was added at the end of each guide.

The design of the SPPOT program identified requirements for several additional types of training products. These include (1) aids for learning the location of system equipment and components, (2) training modules that explain how propulsion systems and equipment operate, and (3) administrative aids that explain how to use SPPOT materials in conducting OJT and in establishing watchstander qualification.

Purpose

The purpose of the effort described in the present report was to develop the remainder of the products included in the SPPOT program.

DEVELOPMENT OF LOCATIONAL AIDS

Requirement

Obviously, before the propulsion watchstander can perform the great majority of his tasks, he must be able to locate specific valves and recognize a flow path of steam, water, or oil within a system. Such abilities are critical to maintaining propulsion operations and avoiding equipment damage or personnel injury. In the data base developed for CONSTELLATION (Main et al., 1981), some 3000 components were identified that were to be monitored or manipulated, and, therefore, located by propulsion watchstanders.

Typically, when a trainee is assigned to a new watchstation, he learns relevant component locations and relationships by physically tracing each system, hand-over-hand. He then makes a paper-and-pencil sketch showing the relative position of each component, which is checked by his training supervisor. Learning about systems in this manner can be a difficult and time-consuming task. Further, the training supervisor may not always be familiar enough with the systems to determine whether a trainee's drawing is complete and accurate. A method is needed to facilitate the process of system tracing and provide a better means for checking trainee's system drawings.

Approach

The approach taken to address this problem was to provide trainees with plant maps that show the location of major equipment within each propulsion space (four main machinery rooms and two auxiliary machinery rooms) for use in tracing individual systems. (Each system was to be drawn on a separate map.) Also, drawings on each system, complete with piping lines, names of valves, and indicators, were developed for use by watch supervisors in checking trainees' system drawings.

These materials were developed by contract personnel (Data Design Laboratories), who went aboard CONSTELLATION, located equipment, and traced systems within the propulsion spaces. They developed (1) plant maps for the six propulsion spaces, (2) from 36 to 39 system drawings for each of the four main machinery spaces, and (3) 13 and 14 system drawings respectively for auxiliary machinery spaces 1 and 2.

Results

A list of the system drawings developed is provided in Appendix A, and a sample of a completed system drawing--for the fuel oil service system in the lower level of Main Machinery Room #1--in Figure 1. In cases where systems to be traced have components on both upper and lower space levels, separate tracings are provided for each level. The

MAIN MACHINERY ROOM NO. 1 USS CONSTELLATION (CV-64) 03364

BHD 119 3.0 FUEL OIL SERVICE SYSTEM (SUCTION SIDE) BHD 119

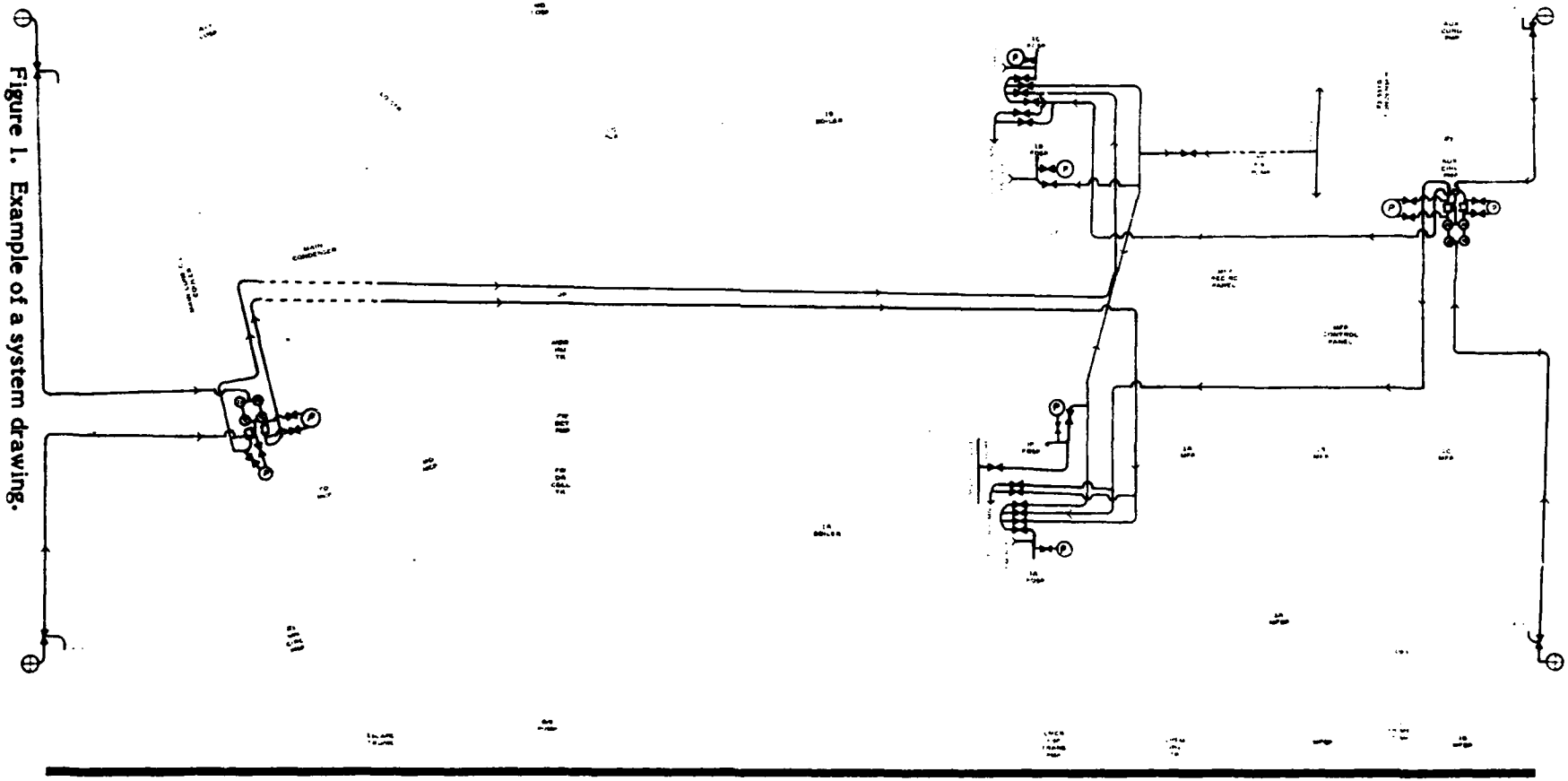

Figure 1. Example of a system drawing.

BHD 106 SHEET 2 OF 3 LOWER LEVEL MMR 1 BHD 106

plant maps given to trainees are similar in appearance to the system drawing shown in Figure 1, except that piping lines, valves, or indicators are not drawn in and the major components (shown as shaded areas) are labeled.

DEVELOPMENT OF TRAINING MODULES AND CARDS

Requirement

It is important that trainees understand how their actions relate to the manner in which the propulsion plant operates; that is, they need to know not only what to do and how to do it, but why it must be done that way. The previously developed SPPOT guides provided an initial link between performance requirements and system functions by organizing actions under functional headings and indicating the consequences of improper procedures (Main et al., 1981). To understand fully the implications of the procedures prescribed in the SPPOT guides, the trainee also needs some basic knowledge about the duties of propulsion watchstanders and the characteristics of propulsion systems and components.

Approach

Training modules and cards were developed to provide this additional information. However, in contrast to the SPPOT guides, which were designed to describe operational procedures, the SPPOT training modules were designed to describe how systems and equipment function; that is, they are organized in terms of physical or functional characteristics rather than operator actions. This was done because watchstanders need to understand each system in its totality, even if they only interact with a part of it. Otherwise, it is difficult for them to perceive the logic that underlies the system's operation.

Because the content of the SPPOT modules was organized in terms of system functions rather than operator actions, their design may appear to be in conflict with a performance-oriented approach, which was identified as an essential strategy in the development of shipboard instruction (Main et al., 1981). However, the modules were written in conformance with guidelines established for the development of performance-oriented text (Kern, Sticht, Welty, & Hauke, 1975).

Modules were grouped into different watchstation packages, each of which contained information about all the systems and equipments to be used by an assigned watchstander. Equipment descriptions included notations on features important to the operator, especially in cases involving safety considerations. Finally, the major watchstander duties were summarized at the end of each module so that the trainees could see how functional characteristics relate to the way systems and equipment are operated.

A systematic effort was made to limit module content to that which was relevant to the task to be performed. In general, information was considered as being relevant if it aided the watchstander in performing his duties, helped him to understand the rationale for performing in a specified manner, or facilitated his learning or retention. Types of information provided to aid performance and understanding included (1) names and functions of systems, equipments, and components, (2) photographs and drawings, (3) significant operational parameters (temperatures, pressures, etc.), and (4) explanations of sequential processes (energy conversions, flow paths, etc.). Information provided to aid learning and retention included (1) statements of training and testing objectives and (2) overviews of system operations that structured procedures into meaningful subgroupings.

Information was considered as not being relevant if it (1) applied to tasks not associated with watchstanding functions (e.g., conducting corrective maintenance), (2) was required at a higher level of watch responsibility than that for which the trainee was being qualified, or (3) provided a level of detail or complexity above that needed to perform required actions or to appreciate the consequences of actions performed. This last criterion resulted in the exclusion of many theoretical principles of propulsion engineering.

To determine which content was appropriate for which personnel, Center personnel conducted interviews with Commander Naval Air Force, U.S. Pacific Fleet Engineering Mobile Training Teams. To determine the physical and functional characteristics of systems and equipment, the following documents were consulted:

1. The Engineering Operational Sequencing System (EOSS).

2. Qualification Section 7 of the Personnel Qualification Standard (PQS) for CONSTELLATION.

3. The Engineering Department's Organizational and Regulation Manual (EDORM).

4. The Plant Operating Guide (POG).

5. Navy technical manuals relating to 1200 psi propulsion plants.

6. Manufacturers' technical manuals on specific equipments.

7. Navy occupational standards.

8. Navy Class "A" propulsion school task analysis documents.

9. Advancement in rating manuals for boiler technicians (BTs) and machinist's mates (MMs).

The draft modules were reviewed by NAVPERSRANDCEN personnel for both technical accuracy and instructional adequacy and revised as necessary.[1]

Results

Two types of SPPOT modules were developed: orientation modules and watchstation modules. Orientation modules cover information needed by the trainee before he is assigned to a watchstation. This includes a general introduction to the progressive duties and assignments of propulsion watchstanders, information on safety and survival, a general explanation of the basic steam cycle, descriptions of the functions and locations of major equipment, and descriptions of the characteristics of components common to many of the systems found in propulsion plants, including valves, pumps, turbines, and indicating instruments. Watchstation modules cover the physical and functional characteristics of the specific systems and equipment that the qualifying watchstander must learn to operate.

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[1] Much of the initial content was written by subject matter experts (SMEs); however, the revisions were made by nonexperts who extracted the required information by questioning the SMEs. This procedure was initiated because it was discovered that personnel with technical expertise find it difficult to anticipate the level of information required by inexperienced trainees.

In addition to the training modules, two types of SPPOT system relations cards were developed. These materials, designed for use by higher-level watchstanders, indicate how the different propulsion systems interact with and affect each other. They focus on the ability to recognize and deal with problems before they result in plant casualties.

Orientation Modules

The orientation modules developed are listed in Table 1. Each module begins with a statement describing the content to be covered and how the trainee will be tested. Diagrams that depict relevant features are included whenever the characteristics of an equipment or component are discussed. Such diagrams are kept as simple as possible; detail is added only when necessary to help trainees recognize relevant internal or external features. When they are used to compare two or more components, emphasis is placed on the key distinguishing features. All diagrams are titled and labeled with the same names and headings used in the text.

Table 1

List of Orientation Modules

Module	Topic
A	Introduction to main propulsion watchstanding.
B	Safety.
C	Survival.
D	Basic steam cycle.
E	Major components in the generation phase.
F	Major equipment in the expansion phase.
G	Major equipment in the condensation phase.
H	Major equipment in the feed phase.
I	Operating temperatures and pressures in the basic steam cycle.
J	Location of major main space equipment.
K	Major steam piping systems.
L	Valves, valve position, and operation.
M	Auxiliary turbines.
N	Pumps.
O	Indicating instruments.

Text content is kept brief and simple. Tables are used whenever possible to organize content into units that can be easily recognized and/or compared. Figure 2 provides an example of a table designed to aid learning of functions; and Figure 3, one designed to aid comparisons of component functions and characteristics.

EQUIPMENT	FUNCTION
SHIP'S WHISTLE	Used to signal intentions and conditions
MAIN ENGINE GLAND SEAL REGULATOR	Seals the glands to keep air out of the main engine and main condenser
MAIN AND AUXILIARY AIR EJECTORS	Remove air and gases from the main and auxiliary condensers
CONSTANT AND INTERMITTENT STEAM REDUCERS	Provides steam for cooking and heating
CROSSCONNECT VALVE	Isolates 150 psi auxiliary steam system in one space from an adjacent space
AUX. EXHAUST AUGMENTING REDUCING STATION	Reduces 150 psi auxiliary steam for use by auxiliary exhaust system if pressure from auxiliary turbine exhaust is insufficient.

Figure 2. Table designed to aid learning of functions.

SUMMARY OF PUMPS

PUMP TYPE	PUMPING MECHANISM	TYPE(S) OR FLUID(S) PUMPED	FLOODED CASING?	VALVE POSITIONING FOR START-UP
CENTRIFUGAL	Impeller	Water	Yes	Open suction valve before starting. Keep discharge valve closed until discharge pressure is established.
PROPELLER	Propeller	Water	Yes	Open suction and main condenser overboard discharge valves before starting
ROTARY	Gears or Screws	Oil	No	Open suction, discharge, and recirculating valves (where installed) before starting
RECIPROCATING	Piston/Plunger	Water, oil, and air	No	Open suction and discharge valves before starting
JET	Nozzle	Air and water	No	Open discharge valve before starting. Do not open suction valve until flow is established.

Figure 3. Table designed to aid comparison of characteristics.

Exercises are provided throughout the modules to (1) focus the trainee's attention on significant content, (2) provide trainee involvement, and (3) promote retention of relevant information. It should be noted that the content of the modules is not organized into frames as is the case with much programmed instruction. Thus, exercises focus on blocks of information rather than on isolated facts to encourage the learning of content in terms of functional relationships. Most of the information covered in the exercises is repeated in a summary test administered by a trainer/supervisor to the trainee as each module is completed. The exercises and tests include questions on (1) watchstander duties, (2) names, locations, functions, and charateristics of equipment and components, (3) directions of flow through systems and equipments, (4) parameter settings (pressures, temperatures, etc.), and (5) readings of various indicating devices.

Both tests and exercises are designed to reflect the knowledge and skills that the trainee will need on the job. For example, trainees are required to take readings on drawings of gauge faces, to state those set points and operating ranges that they would need to memorize as watchstanders, and to state functions of those equipment and components they need to know to understand the rationale behind plant operational procedures. Where appropriate, testing is conducted in the work spaces so that trainees can interact with the actual equipment.

Watchstation Modules

SPPOT watchstation modules are organized into packages, one for each watchstation. These packages include modules for each system or equipment that is aligned or operated by the watchstander assigned to that watchstation, and may include modules that cover generic processes that are independent of specific systems or equipment. Since more than one watchstander may interact with the same system, a given system module may appear in more than one watchstation package. The modules contained in each package are listed in Appendix B.

The watchstation modules are organized and written in generally the same manner as the orientation modules. Each watchstation package includes a table of contents, an introduction that explains how the modules are to be used, and a copy of a PQS document showing those watch qualification items covered by the watchstation package. The introduction includes a brief statement on what the system or equipment does, why it is important, and who operates it. These statements do not provide a detailed description of components and functions but, rather, only enough information to ensure that the trainee has a general idea of the role played by the system or equipment in the operation of the propulsion plant. If a system is complex and has several major sections, each with unique functions, these may also be identified. This information is followed by a brief statement of what the trainee will learn in the module and how he will be tested (asked to state purposes and functions, explain how equipments operate, name components, etc.).

The body of the module contains text, diagrams, and tables that explain how the system or equipment operates. Text is used to describe the general purpose of the system or equipment, and to track sequences of related events (such as flow of fluid, stages of operations, or physical relationships). Components in diagrams are numbered in a logical sequence and referenced by number as well as by name in the text. Tables are used to list components shown in the diagrams and summarize their functions (especially those components that are not discussed in the text). Any safety devices or safety procedures in the tables and diagrams are starred (*) to emphasize their importance.

For complex systems containing several subsystems, a brief overview of the entire system is given, followed by separate discussions of each subsystem. Similarly, when several related components are discussed separately in some detail, an overview of the components is presented first within the context of the system. Extended discussions of complex components are paragraphed to separate the various aspects of the components and to help the trainee recognize the major points being discussed.

Diagrams are constructed in the same general manner as those used in the orientation modules. However, because of the relative complexity of those included in the watchstation modules, greater care is taken in their design. When the amount of information involved in a diagram is not excessive, both names and numbers of components are provided. However, when the amount of detail interferes with the clarity of the diagrams, only numbers are used to identify components. When diagrams are too complex, they are broken up and displayed in sections on separate pages. In such cases, an effort is made to show clearly how the different sections fit together to form the overall system. When possible, an overall summary diagram is also provided to show how the different sections fit together.

Most of the piping diagrams presented in the watchstation modules are schematics and show functional rather than physical locations. However, bulkheads are shown when systems cross from one propulsion space to another. Diagrams are always placed on pages facing the text or tables that describe them. For extended presentations, the same diagrams may be repeated several times to maintain the juxtaposition of diagrams and text.

Exercises included in watchstation modules are similar to those found in the orientation modules. For most of the modules, exercises require the trainee to interact with the equipment and components in his work space. For modules that cover system alignments, exercises also require trainees to trace the systems physically and to draw them on plant locational maps provided at the end of the module. The trainee's supervisor checks the accuracy of the drawings against standard system drawings, as described in the previous section on locational aids.

Modules that deal with systems or equipment that are operated within the context of major propulsion plant evolutions (pre-light-off checks, light-off procedures, operational checks, and securing procedures) include a summary of operator actions performed during the evolutions. All modules include a list of references and a statement of how the trainee should demonstrate his ability to operate the system. Typically, this demonstration includes:

1. Answering questions about the functions of the components and the operating characteristics of the systems and equipment covered in the module.

2. Performing walk-throughs of watch procedures under the guidance of SPPOT guides (procedural training aids that indicate how each watch evolution is to be performed).

3. Performing actual operations using relevant Engineering Operational Procedures (EOP) documents as performance aids.

The watchstation packages provided to MM and BT watch supervisors include a supervisor module that covers the following topics:

1. The role and responsibilities of the watch supervisor.

2. General safety procedures that must be followed and stressed in operating systems.

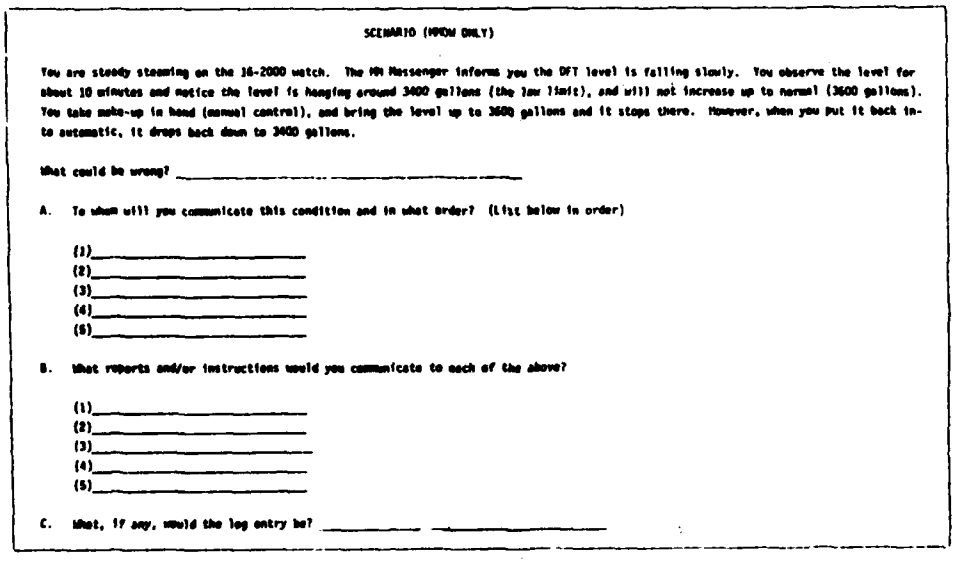
3. The communications network used to coordinate propulsion operations.

4. Examples of system interrelationships that should be mastered.

5. SPPOT materials that are available to aid the watch supervisor in training and qualifying his watch team.

6. Scenarios of problem situations that provide detailed examples of problem situations that the supervisor may encounter so that he has an opportunity to practice thinking through his responses. An example of a scenario is provided in Figure 4.

The supervisor module was designed to be used by both BT and MM supervisors. It covers tasks performed by BT and/or MM supervisors and indicates which tasks apply to each supervisor.



SCENARIO (MMOW ONLY)

You are steady steaming on the 16-2000 watch. The MM Messenger informs you the DFT level is falling slowly. You observe the level for about 10 minutes and notice the level is hanging around 3400 gallons (the low limit), and will not increase up to normal (3600 gallons). You take make-up in hand (manual control), and bring the level up to 3600 gallons and it stops there. However, when you put it back into automatic, it drops back down to 3400 gallons.

What could be wrong? _____

A. To whom will you communicate this condition and in what order? (List below in order)

(1)_____
(2)_____
(3)_____
(4)_____
(5)_____

B. What reports and/or instructions would you communicate to each of the above?

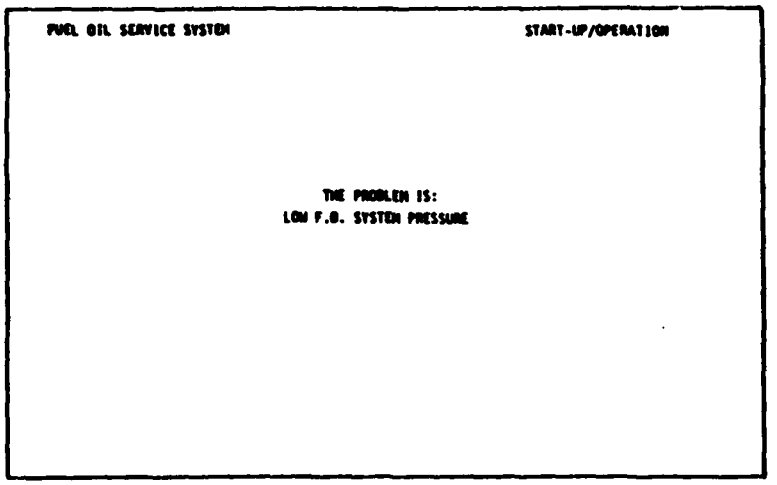
(1)_____
(2)_____
(3)_____
(4)_____
(5)_____

C. What, if any, would the log entry be? _____

Figure 4. Example of a scenario.

System Relations Cards

Two types of SPPOT system relations cards were designed for use by watch supervisors: problem condition and problem correction cards. Problem condition cards present a problem (e.g., low F.O. system pressure) on the front, and the major conditions that would be likely to cause that problem on the back (see Figure 5). (The back of the card provides spaces for listing additional conditions as appropriate.) The trainee studies the cards to learn what conditions could lead to different problems and then tests himself by going through the cards, looking at the problem statements, and recalling the list of possible causes. Sixty problem condition cards, covering 17 propulsion equipments and systems, were developed.



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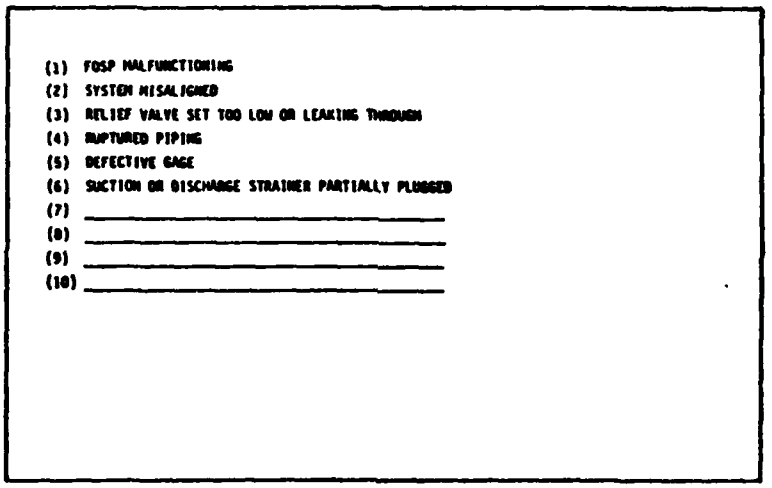

(Back)

Figure 5. Example of a problem condition card.

Problem correction cards also present a problem on the front, along with a list of relevant conditions, and a list of general actions (e.g., report to EOOW) to be taken by the trainee (see Figure 6). The trainee diagnoses the probable cause of the problem by studying the conditions listed and indicates what actions he would take to report and/or correct the problem. He checks his answer by referring to the information on the back of the card. (A reference to appropriate SPPOT guides and modules is also provided for the trainee to review for further information.) After the trainee has studied the cards to learn the conditions that would lead to specific problems and the actions to be taken to correct them, he is tested by another watchstander as follows:

1. The tester reads the problem indicated on the front of the card.

2. The trainee, without looking at the card, requests information (e.g., what is the cooling water pump discharge pressure?).

FRONT

600 PSI AUXILIARY SYSTEM

PROBLEM -1200/600 PSI REDUCER CYCLING

PLANT CONDITIONS:

(1) RELIEF VALVE ON 600 PSI REDUCERS IS LIFTING AT 545 PSI
(2) 1200/600 PSI REDUCER CYCLING
(3) MAIN STEAM PRESSURE IS 1200 PSI
(4) PILOT CONTROL VALVE OPERATING PROPERLY
(5) 1200 PSI AUX. STEAM PRESSURE 1200 PSI

ACTIONS:

(1) REPORT TO EOOW:
(2) INITIAL ACTIONS:
(3) CORRECTIVE ACTION:
(4) FINAL REPORT TO EOOW:

BACK

CAUSE: (1) RELIEF VALVE ON 600 PSI REDUCERS LIFTING AT 545 PSI

ACTIONS:

(1) REPORT TO EOOW:	REPORT THE RELIEF VALVE ON THE 12/6 REDUCER IS LIFTING
(2) INITIAL ACTIONS:	DROP 600 PSI SYSTEM PRESSURE TO 540 PSI
(3) CORRECTIVE ACTION:	SHIFT REDUCERS AND RELIEF VALVE
(4) REPORT TO EOOW:	REPORT PLANT STATUS CHANGE

REFERENCES

SPPOT GUIDES: SYSTEM 7
MODULES: MOD 11 and 4

Figure 6. Example of a problem correction card.

3. The tester responds by reading the relevant condition listed on the card (e.g., cooling water pump discharge pressure is 40 psi).

4. When the trainee has sufficient information, he indicates what he believes to be the cause of the problem and the actions he would take to correct it.

5. The tester then checks these responses against the information on the back of the card.

DEVELOPMENT OF ADMINISTRATIVE AIDS

Requirement

The SPPOT program was designed to tie in with the existing systems associated with OJT and watch qualification. Propulsion personnel are already overburdened with administrative requirements for guiding and tracking the training and qualification of watchstanders. Thus, it was felt that every effort should be made to avoid additions to those requirements. Since the PQS program is currently being used to guide training for the qualification of watchstanders, it was decided that there should be a formal link between the PQS and SPPOT programs. This would include a clear description of how SPPOT materials should be used and a list of the responsibilities of various shipboard personnel with respect to SPPOT implementation.

Approach

NAVPERSRANDCEN and PQS Development Group personnel integrated the necessary information about the SPPOT program into a revised version of the PQS Qualification Section 7 document then in use in CONSTELLATION. Also, they developed a separate PQS Manager's Guide indicating the roles of various shipboard personnel in the administration and implementation of the combined PQS/SPPOT program.

Results

PQS/SPPOT Qualification Section 7 Document

As with the standard PQS Qualification Section 7 document, the revised document contains requirements for all main propulsion watchstations in a single volume. It includes the following:

1. PQS/SPPOT User's Guide. The User's Guide provides a brief description of the PQS and SPPOT systems and explains how the PQS/SPPOT qualification document differs from the standard document. It tells trainees how to qualify for a watch using SPPOT materials and indicates the responsibilities of trainees, instructors, qualification petty officers, training petty officers, watch supervisors, engineering training officers, and Qualification Board members with respect to PQS/SPPOT implementation.

2. Final Sign-off Sheets for Watchstation Qualification. These sheets are the same as those found in typical PQS documents except that they also provide a place for indicating that the SPPOT orientation modules have been completed as a part of the qualification procedure.

3. SPPOT Module Sign-off Sheets. These sheets provide a list of SPPOT modules to be completed by trainees. The qualification petty officer signs and dates the sheet each time the trainee completes a module. As shown in Figure 7, which provides an example of a sign-off sheet, the modules are cross-indexed to the PQS item numbers that they cover.

4. List of SPPOT Guides. This sheet provides the titles and identification numbers of SPPOT guides included in the training program. The numbers are used for cross-referencing in other parts of the PQS/SPPOT document.

III. CV 64--SPPOT Module Listing Cross-indexed to Standard PQS Fundamental and Systems Designations and Sign-off Sheet

SPPOT Module Number	PQS Number	SPPOT Module Name	Signature	Date
A	7101.1	Introduction to main propulsion watchstanding		
B	7103.1	Safety		
C	7103.2	Survival		
D	7102.1	Basic steam cycle		
E	7102.2	Major components in the generation phase		
F	7102.3	Major equipment in the expansion phase		
G	7102.4	Major equipment in the condensation phase		
H	7102.5	Major equipment in the feed phase		
I	7102.6	Operating temperatures and pressures in the basic steam cycle		
J	7101.2	Location of major main space equipment		
K	7102.7	Major steam piping systems		
L	7101.3	Valves, valve position, and operation		
M	7101.4	Auxiliary turbines		
N	7101.5	Pumps		
O	7101.6	Indicating instruments		
1	7302.11a	Taking readings and checking lube oil sump levels		
2	7302.12	Sounding water tanks and taking feedwater samples		
4	7206.1	1200/600 and 600/150 psi reducing stations		
7	7215.1	Lube oil duplex strainers		
8	7203.1	Fuel oil duplex strainers		
9	7204	Forced draft blower		
10	7206.2	1200 psi auxiliary steam system		
11	7207	600 psi auxiliary steam system		
12	7208	150 psi auxiliary steam system		
13	7202.1	Boiler protection steam system		
14	7217	Freshwater and high pressure drain systems		
15	7239	Catapult steam drain system		
16	7205	Main steam system		
17	7238.1	Automatic boiler control (ABC) system		
18	7202.4	Burner front operations		
23	7202.5	Burner front fittings		

Figure 7. Example of a module sign-off sheet.

5. Qualification Item Sign-off Sheets. These sheets indicate the specific PQS performance items that must be completed and signed off for each watchstation. When appropriate, they also indicate the SPPOT modules and guides that are relevant to the item (see Figure 8). The trainee should complete the indicated SPPOT modules and study the indicated SPPOT guides before he is tested on related PQS items. In cases where PQS items are not covered by SPPOT materials, the standard PQS requirement is presented.

6. Appendices. These include information on how to use SPPOT orientation and watchstation modules, a cross index of SPPOT modules and guides with PQS item numbers, and examples of PQS assignment sheets and progress charts.

PQS/SPPOT Manager's Guide

Whereas the PQS/SPPOT Qualification Section 7 document was written primarily for the trainee, the manager's guide was written for those who administer the PQS program. It contains the following:

1. A description of the SPPOT program and materials and how they relate to PQS.

2. An overview of the process by which the trainee is to be qualified through use of SPPOT materials (see Appendix C).

3. A listing of the primary manager duties involved in the administration of SPPOT (see Appendix D).

DISCUSSION AND CONCLUSION

The materials described herein, along with the SPPOT guides described previously (Main et al., 1981), constitute a complete training program for main propulsion watchstanders in normal operational procedures. A prototype version of this program has been completed and has been installed in CONSTELLATION. Efforts are currently underway to determine the effectiveness of the SPPOT program, to revise and modify SPPOT materials to optimize their effectiveness, to determine the effort required to modify SPPOT materials for use in other ships, and to develop a program for establishing and maintaining SPPOT programs throughout the fleet.

The design and content of the SPPOT training materials and administative aids appear well suited for training propulsion plant personnel to become qualified watchstanders within the constraints of the shipboard environment.

RECOMMENDATIONS

1. The outcome of the implementation of the SPPOT program will have significant implications for Navy training programs in general. The SPPOT program was founded on the premise that a significant impact can be made on fleet performance problems by providing training materials that are tailored to meet the needs of the worker and the requirements of the shipboard environment. The operation of main propulsion plants was selected as a testbed because fleet representatives felt that it is the most difficult problem currently being faced by the fleet. There are, however, many other task areas where serious performance problems were reported. If the SPPOT program has a significant impact on fleet operations, consideration should be given to applying similar

7313 Watchstation--Lube Oil and Condensate Watch 7313

To qualify for this watch station requires that you be a qualified SSTG watchstander and demonstrate proficiency in performing the following tasks. The SPPOT modules and guides listed below are designed to assist you in learning these tasks.

7313.1	Tasks	SPPOT Modules	SPPOT Guides	Signature	Date	%
.11	Align, operate, and secure main lube oil purification system	93, 100				5
			System 29			10
.12	Align, operate, and secure main lube oil system; draw daily lube oil samples	92, 99, 105				5
			System 12			5
.13	Assist in aligning and securing 600 psi auxiliary steam system	11				2
			7-A(1.5, 1.7) 7-W(3)			3
.14	Assist in aligning and securing 150 psi auxiliary steam system	12				2
			8-A(1.3, 1.5-1.6, 1.9, 2.1-2.4, 2.6, 5.9) 8-W(1.1, 1.3, 3.3, 3.3, 3.5)			3
.15	Align, operate, and secure freshwater drain tank collecting system (MMR #2 and #3 only)	88				2
			System 19.1			3
.16	Align, operate, and secure main circulating water system; draw daily lube oil samples	96, 101				5
			System 16			5
.17	Start, operate, and secure main condensate system; draw daily lube oil samples	76, 91				5
			17-S(1.4-1.10, 1.13-1.14, 2, 3, 4, 6, 8.3-8.9, 9.2) 17-OP(ST) 17-OP(CK) (1.3-1.4, 2.3) 17-OP(SC) 17-W(1.2-1.4, 1.11, 2, 3, 4.1-4.3)			10

Figure 8. Example of a qualification item sign-off sheet.

problem analysis and training development techniques to other areas where serious problems are being experienced.

2. The underlying research premises and the training objectives and principles that shaped the development of SPPOT materials into their present form should also guide the follow-on SPPOT production efforts to ensure continued effectiveness of shipboard training for propulsion watchstander personnel.

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APPENDIX A

LIST OF SYSTEM DRAWINGS

SYSTEM DRAWINGS FOR MAIN MACHINERY ROOM #1

1.2	Boiler water sample collection system
1.3	Boiler surface and bottom blow system
1.4	Boiler protection steam system
1.5	Boiler soot removal system
3.0	Fuel oil service system
4.0	Pneumatic control air system
5.0	Main steam system
6.0	1200 psi auxiliary steam system
7.0	600 psi auxiliary steam system
8.0	150 psi auxiliary steam system
9.1	High pressure drain system
9.2	Catapult steam drain system
9.3	Lube oil heating coil drain system
10.0	Auxiliary exhaust system
12.0	Main lubricating oil system
13.0	Main engine gland seal system
16.0	Main condenser circulating water system
17.0	Main condensate system
17.2	Condensate recirculating system
17.1.4.3	Condensate seal water to main feed booster pumps
17.1.4.4	Condensate cooling water to main feed pump system
18.0	Main air removal system
19.0	Fresh water drain collecting and morpholine injection system (17.5 make up feed system on sheet 2 of 2)
21.1	Main feed booster system
21.1.1.3	Main feed booster recirculating system
21.1.1.4	Main feed booster pump vent system
21.3.1.6	Main feed pump recirculating system
21.3.4	Main feed piping system
22.0	Reserve feed filling and transfer system
21.2.2	Emergency feed booster and transfer vacuum priming pump system
23.0	Boiler water treatment system
24.0	Auxiliary machinery cooling water system
26.0	Firemain system
27.0	Main drain (eductor) system
28.0	Bilge and stripping system
29.0	Main lube oil purifying system
31.0	Auxiliary gland exhaust system
37.0	Space equipment other than machinery

SYSTEM DRAWINGS FOR MAIN MACHINERY ROOM #2

1.2	Boiler water sample collection system
1.3	Boiler surface and bottom blow system
1.4	Boiler protection steam system
1.5	Boiler soot removal system
3.0	Fuel oil service system
4.0	Pneumatic control air system
5.0	Main steam system
6.0	1200 psi auxiliary steam system
7.0	600 psi auxiliary steam system
8.0	150 psi auxiliary steam system
9.1	High pressure drain system
9.2	Catapult steam drain system
9.3	Lube oil heating coil system
10.0	Auxiliary exhaust system
12.0	Main lubricating oil system
13.0	Main engine gland seal system
16.0	Main condenser circulating water system
17.0	Main condensate system
17.2	Condensate recirculating system
17.1.4.3	Condensate seal water to main feed booster pumps
17.1.4.4	Condensate cooling water to main feed pump system
18.0	Main air removal system
19.0	Fresh water drain collecting and morpholine injection system (17.5 make up feed system on sheet 2 of 2)
21.1	Main feed booster system
21.1.1.3	Main feed booster recirculating system
21.1.1.4	Main feed booster pump vent system
21.3.1.6	Main feed pump recirculating system
21.3.4	Main feed piping system
22.0	Reserve feed filling and transfer system
21.2.2	Emergency feed booster and transfer vacuum priming pump system
23.0	Boiler water treatment system
24.0	Auxiliary machinery cooling water system
26.0	Firemain system
27.0	Main drain (eductor) system
28.0	Bilge and stripping system
29.0	Main lube oil purifying system
31.0	Auxiliary gland exhaust system
37.0	Space equipment other than machinery

SYSTEM DRAWINGS FOR MAIN MACHINERY ROOM #3

1.2	Boiler water sample collection system
1.3	Boiler surface and bottom blow system
1.4	Boiler protection steam system
1.5	Boiler soot removal system
3.0	Fuel oil service system
4.0	Pneumatic control air system
5.0	Main steam system
6.0	1200 psi auxiliary steam system
7.0	600 psi auxiliary steam system
8.0	150 psi auxiliary steam system
9.1	High pressure drain system
9.2	Catapult steam drain system
9.3	Lube oil heating coil drain system
10.0	Auxiliary exhaust system
12.0	Main lubricating oil system
13.0	Main engine gland seal system
16.0	Main condenser circulating water system
17.2	Main condensate system
17.1.4.3	Condensate seal water to main feed booster pumps
17.1.4.4	Condensate cooling water to main feed pump system
18.0	Main air removal system
19.0	Fresh water drain collecting and morpholine injection system (17.5 make up feed system on sheet 2 of 2)
21.1	Main feed booster system
21.1.1.3	Main feed booster recirculating system
21.1.1.4	Main feed booster pump vent system
21.3.1.6	Main feed pump recirculating system
21.3.4	Main feed piping system
22.0	Reserve feed filling and transfer system
21.2.2	Emergency feed booster and transfer vacuum priming pump system
23.0	Boiler water treatment system
24.0	Auxiliary machinery cooling water system
26.0	Firemain system
27.0	Bilge and stripping system
29.0	Main lube oil purifying system
31.0	Auxiliary gland exhaust system
37.0	Space equipment other than machinery

SYSTEM DRAWINGS FOR MAIN MACHINERY ROOM #4

1.2	Boiler water sample collection system
1.3	Boiler surface and bottom blow system
1.4	Boiler protection steam system
1.5	Boiler soot removal system
3.0	Fuel oil service system
4.0	Pneumatic control air system
5.0	Main steam system
6.0	1200 psi auxiliary steam system
7.0	600 psi auxiliary steam system
8.0	150 psi auxiliary steam system
9.1	High pressure drain system
9.2	Catapult steam drain system
9.3	Lube oil heating coil drain system
10.0	Auxiliary exhaust system
12.0	Main lubricating oil system
13.0	Main engine gland seal system
15.0	Main thrust bearing and lubricating oil system
16.0	Main condenser circulating water system
17.0	Main condensate system
17.2	Condensate recirculating system
17.1.4.3	Condensate seal water to main feed booster pumps
17.1.4.4	Condensate cooling water to main feed pump system
18.0	Main air removal system
19.0	Fresh water drain collecting and morpholine injection system (17.5 make up feed system on sheet 2 of 2)
21.1	Main feed booster system
21.1.1.3	Main feed booster recirculating system
21.1.1.4	Main feed booster pump vent system
21.3.1.6	Main feed pump recirculating system
21.3.4	Main feed piping system
22.0	Reserve feed filling and transfer system
21.2.2	Emergency feed booster and transfer vacuum priming pump system
23.0	Boiler water treatment system
24.0	Auxiliary machinery cooling water system
26.0	Firemain system
27.0	Main drain (eductor) system
28.0	Bilge and stripping system
29.0	Main lube oil purifying system
31.0	Auxiliary gland exhaust system
37.0	Space equipment other than machinery

SYSTEM DRAWINGS FOR AUXILIARY MACHINERY ROOM #1

4.0	Pneumatic control air system
5.0	Main steam system
8.0	150 psi auxiliary steam system
9.1	High pressure drain system
9.3	Lube oil heating coil drain system
10.0	Auxiliary exhaust system
17.0	Main condensate system
17.2	Condensate recirculating system
19.0	Fresh water drain collecting system
22.0	Reserve feed filling and transfer system
27.0	Main drain (eductor) system
30.0	Auxiliary lube oil purifying system
37.0	Space equipment other than machinery

SYSTEM DRAWINGS FOR AUXILIARY MACHINERY ROOM #2

5.0	Main steam system
6.0	1200 psi auxiliary steam system
9.2	Catapult steam drain system
8.0	150 psi auxiliary steam system
9.1	High pressure drain system
10.0	Auxiliary exhaust system
15.0	Main thrust bearing and lubricating system
17.0	Main condensate system
17.2	Condensate recirculating system
19.0	Fresh water drain collecting system
22.0	Reserve feed filling and transfer system
27.0	Main drain (eductor) system
30.0	Auxiliary lube oil purifying system
37.0	Space equipment other than machinery

APPENDIX B

LIST OF WATCHSTATION MODULES

List of Watchstation Modules

Item	Module Number	Module Title
For cold iron watch	1	Taking readings and checking L.O. sump levels
	2	Sounding water tanks and taking feedwater samples
	40	Main drain (eductor) system
	38	Auxiliary machinery cooling water system
	12	150 psi auxiliary steam system
	66	Key valves and controllers (MM messenger)
For BT messenger	1	Taking readings and checking L.O. sump levels
	2	Sounding water tanks and taking feedwater samples
	8	Fuel oil duplex strainer
	105	Lubrication
	9	Forced draft blower
	10	1200 psi auxiliary steam system
	16	Main steam system
	14	Freshwater and high pressure drain systems
	15	Catapult steam drain system
	4	1200/600 and 600/150 psi reducing stations
	11	600 psi auxiliary steam system
	12	150 psi auxiliary steam system
	13	Boiler protection steam system
For burnerman	18	Burner front operations
	25	Fuel oil service system
	23	Burner front fittings
	104	Foster-Wheeler "D" type boiler
	32	Boiler soot blower system
	31	Boiler chemical injection system
	24	Boiler surface and bottom blow system
For checkman	30	Main feed piping system
	104	Foster-Wheeler "D" type boiler
	24	Boiler surface and bottom blow system
	31	Boiler chemical injection system
	32	Boiler soot blower system
	29	ACC air compressor and air receiver
	8	Fuel oil duplex strainer
For BT pumpman	25	Fuel oil service system
	33	Fuel oil service pump
	13	Boiler protection steam system

List of Watchstation Modules (Continued)

Item	Module Number	Module Title
For BT pumpman (Continued)	18	Burner front operations
	104	Introduction to the Foster-Wheeler "D" type boiler
	87	Reserve feed filling and transfer system
	31	Boiler chemical injection system
	24	Boiler surface and bottom blow system
	32	Boiler soot blower system
	40	Main drain (eductor) system
	34	Bilge and stripping pump
	39	Bilge and stripping system
	38	Auxiliary machinery cooling water system
	88	Morpholine injection system and fresh water drain collecting tank
For boiler console operator	17	Automatic boiler control (ABC) system
For watch supervisor (BT)	46	BT/MM watch supervisor (BTOW/MMOW)
	104	Introduction to the Foster-Wheeler "D" type boiler
	18	Burner front operations
	23	Burner front fittings
	105	Lubrication
	31	Boiler chemical injection system
For thrust block watch	53	Thrust block lube oil system
	67	Main shafting
	105	Lubrication
For MM messenger	54	Taking readings and checking shaft alleys
	66	Key valves and controllers (MM messenger)
	105	Lubrication
	65	Auxiliary gland exhaust system
	67	Main shafting
	12	150 psi auxiliary steam system
	62	Auxiliary exhaust steam system
	106	Deaerating feed tank
	14	Freshwater and high pressure drain systems
	15	Catapult steam drain system
	61	Lube oil heating cold drain system
	55	Main engine jacking gear

List of Watchstation Modules (Continued)

Item	Module Number	Module Title
For MM messenger (Continued)	68	Main engine and reduction gear
	64	Main air removal system
	63	Main engine gland seal
	16	Main steam system
For ship's service turbo-generator (SSTG) watch	75	Auxiliary circulating and auxiliary condensate pumps
	74	Auxiliary air removal system
	77	Ship's service turbogenerator
	16	Main steam system
	62	Auxiliary exhaust steam system
For lube oil/condensate watch	93	Main lube oil purifier
	100	Main lube oil purification system
	92	Main lube oil service pump (MLOSP)
	99	Main lube oil service system
	105	Lubrication
	11	600 psi auxiliary steam system
	12	150 psi auxiliary steam system
	88	Freshwater drain collecting tank and morpholine injection systems
	96	Main circulating pump
	101	Main condenser circulating water system
	76	Main condensate system
	91	Main condensate pump
	7	Lube oil duplex strainers
	62	Auxiliary exhaust steam system
	40	Main drain (eductor) system
	83	Fire and flushing pump
For main feed pump watch	38	Auxiliary machinery cooling water system
	62	Auxiliary exhaust steam system
	87	Reserve feedwater filling and transfer system
	79	Main feed booster pump
	86	Main feed booster system
	30	Main feed piping system

List of Watchstation Modules (Continued)

Item	Module Number	Module Title
For main feed pump watch (Continued)	78	Main feed pump
	85	Main feed pump recirculating system
	88	Freshwater drain collecting and morpholine injection systems
	83	Fire and flushing pump
	40	Main drain (eductor) system
For throttleman	69	Throttle operations
	72	Throttleboard key gages, alarms, and controls
For MM watch supervisor	46	BT/MM watch supervisor
	77	Ship's service turbogenerator system
	68	Main engine and reduction gear
	105	Lubrication
	7	Lube oil duplex strainers
For EM propulsion watchstanders	A	Introduction to main propulsion watchstanding
	B	Safety
	C	Survival
	D	Basic steam cycle
	8101.4	Taking readings (electrical)
	8203	Emergency diesel generator system
	8304	Emergency diesel generator switchboard
	8207	400 cycle distribution system
	8205	Ship's service distribution system
	8305	Ship's service switchboard control benchboard
	8306	Electrical plant set-up panel
	8206	Ship's service turbine generator system

APPENDIX C

OVERVIEW OF TRAINEE QUALIFICATION

OVERVIEW OF TRAINEE QUALIFICATION

Interview

The division officer, division chief petty officer, and/or work center supervisor interview the trainee on his previous propulsion plant experience. Based on the results of the interview and a review of the trainee's service record, he should be given a qualification plan to follow. He should then be assigned to Engineering "I" Division or to a watchstation to begin qualification.

Orientation Package

The trainee's first step in becoming qualified is to complete all the modules in the orientation package (which should take about 14 days). This package may be issued during engineering indoctrination or when the trainee reports to his main propulsion space for duty. In either case, he should be instructed on how to use the materials by the watch supervisor, training petty officer, or "instructor" (qualified operator). As he completes each module, the qualifying petty officer should sign him off on the appropriate sheet in his PQS/SPPOT booklet. When he has completed all orientation modules, he should be signed off in his PQS/SPPOT booklet, page 7, *final sign-off sheet* for watchstation qualifications, and his progress should be recorded on the PQS personnel progress chart. He should then be assigned to his first watchstation for qualification.

Watchstation Qualification

For each watchstation the trainee is assigned (he should be limited to one at a time), he should be given the applicable watchstation workbook and access to relevant SPPOT guides and piping diagrams to aid him in qualifying in the shortest possible time. Generally, he should be given 30 days to qualify on all watchstations except for the console operator and top watches. The latter watchstations should require about 90 days each. A qualified watchstander should be assigned him as his instructor to assure he uses the materials properly, to guide his progress, and to assist him in attaining qualification.

For each task listed in the PQS sign-off sheet, the instructor should briefly describe the required procedures using the SPPOT guides and show the trainee the equipment he will operate. The trainee should then go through the module, following the instructions and doing all of the exercises. After completing the module, he should practice the procedures using the listed SPPOT guide(s). Once he has completed all of the requirements for a task, he should be tested by the instructor or qualification petty officer. He should be asked questions from the modules and be required to show that he can do everything called for in the SPPOT guides covering the task. However, he should use the EOP for qualification with the tester using the SPPOT guide (the SPPOT guides include questions the tester should use). If the trainee passes the test, he should be signed off for the applicable SPPOT module and task completion and continue on to the next listed task. This procedure should be repeated on sign-off for all tasks, including emergency condition and infrequent operation tasks, and on sign-offs for standing four satisfactory watches under qualified supervision. Note the percent columns at the end of the tasks in the watchstation PQS sign-off sheets. These percentages add up to 90 percent with 10 percent remaining for the emergency condition and infrequent operation tasks. Normally the trainee should complete 25 percent of the requirements per week.

The final qualification should consist of a check by the watch supervisor (and possibly the work center supervisor). He should question the trainee on all systems and require that he demonstrate he can perform the procedures in accordance with EOP. The watch

supervisor recommends the trainee to a qualification board when he thinks the trainee fully understands his duties and can perform his assigned tasks.

The qualification board should normally include an officer, watch supervisor, and/or qualification petty officer. The engineering officer and/or MPA will sit on Top Watch Boards. The board members may ask questions about every task the trainee performs, and may ask the trainee to draw a diagram of any system he is responsible for operating. When the qualification board is satisfied that the trainee can perform all of his assigned tasks, they will recommend to the engineering officer, via the MPA, that the trainee be awarded final qualification for the watchstation. If the board does not find the trainee fully qualified, they should specify the additional work areas he requires study on. If the board finds the trainee almost fully qualified, they may recommend he receive an interim (I) qualification until he fully qualifies. For an interim qualification, the candidate must reappear before the board within 60 days for full qualification or to review the interim qualification.

APPENDIX D

SPPOT MANAGER DUTIES

SPPOT MANAGER DUTIES

The following are recommended functions and responsibilities for each of the major individuals involved with the management of the PQS/SPPOT program. The responsibilities are intended to supplement those listed in NAVEDTRA 43100-1B and fleet and type commander directives. If any conflict exists with those directives, they take precedence.

Engineering Officer

1. Determine the "entry level" of newly reported individuals based upon past duty station, previous qualifications, en route schooling, Page Four Service Record entries, and division officer/leading petty officer/work center supervisor recommendations.

2. Set and monitor PQS/SPPOT goals for the department. Coordinate with the MPA, division officer, engineering training officer, cognizant chief petty officers, and work center supervisors the training and qualification goals of each individual assigned to the engineering department.

3. Serve as chairman of the Watch Qualification Board.

4. Approve departmental watch qualification below watch supervisor. Recommend to the commanding officer final qualification of watch supervisors and above.

5. Assure adequate quantities of PQS/SPPOT materials are available.

6. Assure that PQS/SPPOT is used as intended.

Main Propulsion Assistant (MPA)

1. Manage the PQS/SPPOT program as directed by the engineering officer.

2. Conduct periodic individual spot check examinations of main propulsion personnel to assure PQS/SPPOT program is being properly conducted.

3. Provide technical assistance to the engineering officer, engineering department division officers, and engineering department training officer in executing SPPOT program.

4. Assist on watch qualification boards as directed by the engineering officer.

Division Officers/Division Chiefs/Work Center Supervisors

1. Supervise divisional PQS/SPPOT program.

2. Recommend to the engineering officer the assignment of division qualification petty officers and division training petty officers.

3. Recommend to the engineering officer the entry level of newly assigned personnel.

4. Assign training and PQS goals to individual trainees in accordance with departmental guidance.

5. On a weekly basis, monitor the progress of division personnel toward training and PQS goals as shown on PQS personnel progress charts.

6. Supervise division qualification petty officers and division training petty officers in the conduct of their PQS/SPPOT duties.

7. Brief the engineering officer monthly on the status of division personnel in terms of PQS progress. Adjust goals accordingly.

8. Function as qualification board member when requested.

9. Ensure that Page Four Service Record documentation of PQS is accomplished.

10. Ensure that enlisted evaluations reflect PQS qualification accomplishments.

11. Ensure that SPPOT training materials are provided trainees.

12. Designate instructors for all trainees and ensure they perform their duties as outlined (see PQS/SPPOT qualification booklet, users guide section and appendices, for detailed listing of instructor duties).

Engineering Training Officer/Chief Petty Officer

1. Ensure that overall PQS/SPPOT program is carried out as intended.

2. Manage and conduct the SPPOT propulsion plant orientation course to ensure it is carried out as specified in the materials.

3. Issue new personnel the PQS booklet for CV 64 Main Propulsion, Qualification Section 7, for use with the SPPOT program, and ensure they understand the contents.

4. Ensure that adequate supplies of SPPOT/PQS materials are maintained and available to the training petty officers for issue to the trainees.

5. Ensure interim approved changes are incorporated in the applicable PQS/SPPOT materials and permanent approved changes are submitted to the engineering officer for incorporation in future PQS/SPPOT revisions.

6. Monitor trainee SPPOT/PQS qualification progress and take appropriate remedial action when required.

7. Instruct training petty officers in their duties and monitor their performance to ensure effective management of trainee progress.

8. Establish and schedule QUAL boards as required, instruct board members as to their duties, and provide them appropriate SPPOT testing materials.

Watch Supervisor

1. Recommend changes required to keep PQS/SPPOT technically correct.

2. When the trainee demonstrates he can perform to your satisfaction, sign off the applicable tasks in his PQS/SPPOT booklet and recommend he go before the qualification board.

3. Assign qualified operator as instructor for each trainee.

Qualification Petty Officer

1. Keep abreast of revisions/changes to equipment, systems, and policies that affect assigned areas of responsibility.

2. Recommend PQS/SPPOT changes as needed to the supervisor.

3. Assist and evaluate trainees as needed and sign off completed tasks.

4. Ensure that the PQS program is properly carried out.

Training Petty Officer

1. Keep track of qualification and training progress for all personnel in your division.

2. Maintain the PQS personnel progress chart (page 11), listing each watchstander in the division along with his level of qualification and current level of progress toward qualification on the next watchstation.

3. Update the progress of all trainees weekly.

4. Fill out the PQS assignment sheet as directed by the division officer or work center supervisor.

5. Issue the appropriate SPPOT materials when assigning the trainee to his next watchstation.

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